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SHERMAN, STEPHEN G	
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2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/606,832	KIM ET AL.	
	Examiner	Art Unit	
	Stephen G. Sherman	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Appeal Brief filed the 8 November 2006. Claims 1-24 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the low path switching part and the shutdown circuit as described in the specification. Figure 5 shows the low path switching part 124 and the shutdown circuit 126 as being outside of the inverters 110, 112 and 114 while supplying the INVERTER ON/OFF SIGNAL and the SHUT DOWN ON/OFF SIGNAL respectively, however, Figures 6 and 7 each show the low path switching part 124 and the shutdown circuit 126 respectively, which show each of these circuits receiving the INVERTER ON/OFF SIGNAL and the SHUT DOWN ON/OFF SIGNAL respectively, and the specification describes, in paragraphs [0030] and [0032], that each of the inverters has a low path switching part and a shutdown circuit. This means that Figure 5 inaccurately depicts what is explained

in the specification, however, if the drawing is correct then there are enablement issues and 112-1st paragraph issues will be raised. Currently for the purpose of examination the examiner will assume that each inverter contains a low path switching part and a shut down circuit and that drawing 5 is inaccurate. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

Repeatedly throughout the specification the applicant has used the word "may." The word "may" means "to have the ability to." The use of this word in the specification is used in the description of how the invention works and therefore the functions ARE performed. The problem with using the word may is that saying something may include something doesn't necessarily mean that it does include it, and with the present invention the feature must be included in order for the invention to work. Some examples from the specification of improper use of this work can be found in paragraphs [0029]-[0030] which state:

The third inverter 114 may receive and convert the inverter drive voltages Vin into alternate currents to supply the lamp drive voltages to the third backlight lamp 120. In addition, the third inverter 114 **may** receive the low path ON and OFF signals to control current flow to the low path of the third backlight !amp 120, and **may** control the third backlight lamp 120 to perform the shutdown function by producing shutdown ON and OFF signals.

FIG. 6 is a schematic circuit diagram of an exemplary low path switching part as shown in FIG. 5 according to the present invention. In FIG. 6, each of the first, second, and third inverters 110, 112, and 114 (in FIG. 5) **may** include a transformer 122 that **may** receive and convert the inverter drive voltage Vin into alternate currents to supply lamp drive voltages to the high path of the first, second, and third backlight lamps 116, 118, and 120. In addition, each of the first, second, and third inverter 110, 112, and 114 (in FIG. 5) **may** include a switching part !24 to control the low path of the backlight lamps 116, 118, and 120 (in FIG. 5) by supply of the inverter ON and OFF signals.

By using the word may in these paragraphs, the specification is saying that the inverters may include a transformer that may receive and convert the inverter drive voltage, but they may not, however, the inverters DO include transformers.

Appropriate correction of the entire specification is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 9 recites the limitation "the backlight lamp." There is insufficient antecedent basis for this limitation in the claim.

7. Claim 19 recites the limitation "the first driver." There is insufficient antecedent basis for this limitation in the claim.

8. Claim 22 recites the limitations "the second driver" and "the second switching part." There is insufficient antecedent basis for these limitations in the claim.

9. Claims 1-24 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1, 9 and 18 each recite the limitations of: "shutdown circuit," "the inverters receive a voltage input through the low path of the backlight lamp to perform a shutdown function" and "receiving a voltage input through the low path of the backlight lamp to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal," respectively. These limitations are indefinite because in Figure 5 the shutdown circuit 126 is shown as being external from the inverters 110, 112, and 114, however, Figure 7 shows the shutdown circuit 126 as being the inverters 110, 112 and 114 and also paragraph [0032] describes that the shutdown circuit is provided inside each of the inverters. Therefore the claimed limitations are indefinite because it is unclear from the specification whether the shutdown circuit 126 as shown in Figure 7 is inside of each inverter or whether it is outside of the inverters as shown in Figure 5.

Independent claims 1, 9 and 18 each recite the limitations of: "a low path switching part," "selectively connect a low path of each of the backlight lamps with a ground voltage source" and "selectively connecting a low path of each of the backlight lamps with a ground voltage source in response to an external ON/OFF signal," respectively. These limitations are indefinite because in Figure 5 the low path switching part 124 is shown as being external from the inverters 110, 112, and 114, however, Figure 6 shows the low path switching part 124 and paragraph [0030] describes that the low path switching part is provided inside each of the inverters. Therefore the claimed

limitations are indefinite because it is unclear from the specification whether the low path switching part 124 as shown in Figure 6 is inside of each inverter or whether it is outside of the inverters as shown in Figure 5.

Claims 9-17 recite the limitation "...and the inverters receive a voltage input through the low path of the backlight lamp to perform a shutdown function..." This is indefinite because there are a plurality of backlight lamps and by only stating "the backlight lamp" it is unclear which backlight lamp the claim is referring to, it could be any one of the backlight lamps or a specific backlight lamp that corresponds to a specific inverter.

Independent clams 1, 9 and 18 each recite the limitations of: "selectively connecting low paths of the plurality of backlight lamps with a ground voltage," "selectively connect a low path of each of the backlight lamps with a ground voltage" and "selectively connecting a low path of each of the backlight lamps with a ground voltage," respectively. These limitations are indefinite because in Figure 5 the low paths of the lamps 116, 118 and 120 are all connected to a common node, which is then commonly connected to the inverters 110, 112 and 114. The specification then states in paragraph [0039] that by turning switches Q1, Q2, Q3 and Q4 ON, the low path of the first light is connected to ground and the lamp 116 is ON, then paragraphs [0041]-[0042] state that inverters 112 and 114 can the turn switches Q1, Q2, Q3 and Q4 OFF and then the two path of the second and third lights are not connected to ground and the

lamp 118 and 120 are OFF. The examiner understands that based on the drawing in Figure 5, that if a connection is maintained for the low path of backlight 116 to ground, then the other lamps will also be connected to ground even if the switches from inverters 112 and 114 are disconnected because all of the low paths are connected together. Therefore it is unclear from the specification and the claims as to how the connections of the different backlights to ground can be selectively controlled based on the drawing shown in Figure 5.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-7, 9-16 and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payne (US 5,420,779) in view of Okita (US 6,023,131).

Regarding claim 1, Payne discloses an inverter device (Figure 1, item 11) for a liquid crystal display, comprising:

a transformer (Figure 2C, item T1) for receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of a backlight lamp (Column 5, lines 7-14); and

a low path switching part (Figures 2A-2D, items Q2 and QX1 are connected to the low path of the backlight lamp CCFL through connection 108.); and

a shutdown circuit (Figure 1, item 15) for receiving a voltage input (Figure 1, item 106) through the low path of the backlight lamp (Figure 1, item 108) to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal (Column 3, lines 33-37.The examiner interprets the signal sent to disable the inverter circuit to be the shutdown ON/OFF signal).

Payne fails to teach of an inverter device for a liquid crystal display comprising a low path switching part selectively connecting a low paths of a plurality backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal, and a transformer for supplying the AC lamp drive voltage to a high path of one of a plurality of backlight lamps.

Okita disclose of an inverter device for a liquid crystal display (Figure 1) comprising:

a low path switching part selectively connecting a low paths of a plurality backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal (Figure 1 shows a low path switching part as switches 8, 9 and 10 which selectively connect the backlight of the lamps 5, 6 and 7 respectively to ground in response to an inverter ON/OFF signal, which is explained in column 3, lines 4-6 and lines 24-35. Figure 2 shows that when the inverter is ON, which is in response to the state of switch 2 to control the inverter from being ON/OFF, i.e. an inverter ON/OFF signal, then the switches 8, 9 and 10 are controller to be ON/OFF.); and

a transformer for supplying the AC lamp drive voltage to a high path of one of a plurality of backlight lamps (Figure 1 shows inverter 3 which is connected to the high paths of each one of the lamps 5, 6 and 7.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to provide the low path switching part as taught by Okita in the inverter device taught by Payne to ensure that it is possible to control a plurality of lamps with only one inverter in order to realize an inexpensive, compact system where useless power consumption can be prevented.

Regarding claim 2, Payne and Okita disclose the device according to claim 1.

Payne also discloses wherein the low path switching part includes:

a first driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 can supply a

voltage to the low path of the backlight lamp in response to the ON/OFF signal, ENABLE. Q5 receives the ON/OFF signal through U1 connection 1, then the driver, Q5 and Q6, supplies the inverter drive voltage, VCC, which is also received through U1 connection 1, to the first switching part which is connected to the low path of the backlight lamp); and

a first switching part (Figures 2A, 2B, 2C and 2D, items QX1 and Q2) connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver (Figures 2A, 2B, 2C and 2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1, which is connected to ground. Q2 receives an output signal from Q6 and Q5, the driver, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground).

Regarding claim 3, Payne and Okita disclose the device according to claim 2.

Payne also discloses the first driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) includes:

a first switch being switched in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

a second switch supplying the inverter drive voltage to the first switching part in response to a state of the first switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply

the inverter drive voltage, VCC, which it receives through U1 connection 1, to the first switching part, Q2 and Qx1).

Regarding claim 4, Payne and Okita disclose the device according to claim 3.

Payne also discloses wherein the first switching part (Figures 2A, 2B, 2C and 2D, items Q2 and QX1) includes:

first and second field effect transistors (Q2 and Qx1 are shown in Figure 2A to be FETs) connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch (Figures 2A, 2B, 2C and 2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1, which is connected to ground. Q2 receives an output signal from Q6, the second switch, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground); and

a resistor (Figure 2D, item R3) connected between the low path of the backlight lamp and the first field effect transistor (Figures 2A, 2B, 2C and 2D, item R3 is connected to 108, the low path of the backlight lamp, and also connected to the first field effect transistor, Q2, through the connection between Q2 and Q14 and then through line 106).

Regarding claim 5, Payne and Okita disclose the device according to claim 1.

Payne also discloses wherein the shutdown circuit includes:

a second driver (Figures 2A, 2B, 2C and 2D, items Q6 and Q5) selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the-shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 supply the inverter drive voltage VCC through U1 connection 1 to the low path of the backlight lamp through Q2 in response to ENABLE which is received through U1 connection 1);

a second switching part (Figures 2A, 2B, 2C and 2D, items Q13 and Q14) providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are a part of item 15 of Figure 1. Column 3, lines 33-37 states that a detection circuit sends a signal to disable the inverter circuit if a malfunction is detected. The examiner interprets this as providing either an enabling or disabling function, and as seen in Figures 2A, 2B, 2C and 2D, Q13 can receive a signal from Q6 of the second driver through its connection to Q2); and

an error amplifier monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part (Figure 1, items 15 and 106 and column 5, lines 24-25. The examiner interprets this to mean that monitoring is occurring at all times which would also be when the shutdown function is enabled by the second switching part).

Regarding claim 6, Payne and Okita disclose the device according to claim 5.

Payne also discloses wherein the second driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) includes:

a third switch being switched in response to the shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

a fourth switch supplying the inverter drive voltage to the second switching part in response to a state of the third switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply the inverter drive voltage, VCC, which it receives through U1 connection 1, to the second switching part, Q13 and Q14).

Regarding claim 7, Payne and Okita disclose the device according to claim 6.

Payne also discloses wherein the second switching part (Figures 2A, 2B, 2C and 2D, items Q13 and Q14) includes:

third and fourth field effect transistors (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are FETs) connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are connected to the low path of the backlight lamp through Q14 which is connected to item 108, the low path of the lamp. Q14 is connected to ground through C9. Q13 receives an output signal from Q6, the second switch, through Q2 which would therefore allow Q13 and Q14 to connect 108, the low path of the backlight lamp, to ground); and

a resistor (Figure 2D, item R3) connected between the low path of the backlight tamp and the third field effect transistor (Figures 2A, 2B, 2C and 2D, item R3 is connected to 108, the low path of the backlight lamp, and also connected to the first field effect transistor, Q14 through line 106).

Regarding claim 9, Payne discloses a backlight lamp monitoring device for a liquid crystal display, comprising:

a backlight lamp (Figure 1, CCFL); and

an inverter (figure 1, item 11) receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path of the backlight lamp (Column 5, lines 7-14); and

the inverter receives a voltage input through the low path of the backlight lamp to perform a shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal (Figure 1, item 15 receives a voltage input through line 106 from the backlight lamp connection 108. In column 3, lines 33-37 the examiner interprets the signal sent to disable the inverter circuit to be the shutdown ON/OFF signal).

Payne fails to teach of the backlight lamp monitoring device for a liquid crystal display comprising a plurality of backlight lamps, wherein the inverter selectively connects a low path of each of a backlight lamp with a ground voltage source in response to an external inverter ON/OFF signal.

Okita discloses a backlight lamp device for a liquid crystal display comprising a plurality of backlight lamps, wherein the inverter selectively connects a low path of each of a backlight lamp with a ground voltage source in response to an external inverter ON/OFF signal (Figure 1 shows a low path switching part as switches 8, 9 and 10 which selectively connect the backlight of the lamps 5, 6 and 7 respectively to ground in response to an inverter ON/OFF signal, which is explained in column 3, lines 4-6 and lines 24-35. Figure 2 shows that when the inverter is ON, which is in response to the state of switch 2 to control the inverter from being ON/OFF, i.e. an inverter ON/OFF signal, then the switches 8, 9 and 10 are controller to be ON/OFF.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to provide the low path switching part as taught by Okita in the inverter device taught by Payne to ensure that it is possible to control a plurality of lamps with only one inverter in order to realize an inexpensive, compact system where useless power consumption can be prevented.

Payne and Okita fail to teach of the backlight lamp monitoring device for a liquid crystal display comprising a plurality of inverters, each receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path of each of the backlight lamps.

Okita does disclose in a different embodiment of the backlight lamp monitoring device for a liquid crystal display comprising a plurality of inverters, each receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path of each of the backlight

lamps (Figure 4 and column 2, lines 12-21 explain that there are individual inverters 3a, 3b and 3c for each of the lamps 5, 6 and 7 respectively.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to provide an inverter for each of the backlight lamps as taught by Okita in the inverter device taught by the combination of Payne and Okita to order to better control the light of the lamps by individually controlling the supplied power source to the respective inverters.

Regarding claim 10, Payne and Okita disclose the device according to claim 9.

Payne also discloses each of the inverters including:

a transformer (Figure 2C, item T1) for receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of a backlight lamp (Column 5, lines 7-14); and

a low path switching part (Figures 2A-2D, items Q2 and QX1 are connected to the low path of the backlight lamp CCFL through connection 108.); and

a shutdown circuit (Figure 1, item 15) for receiving a voltage input (Figure 1, item 106) through the low path of the backlight lamp (Figure 1, item 108) to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal (Column 3, lines 33-37.The examiner interprets the signal sent to disable the inverter circuit to be the shutdown ON/OFF signal).

Okita also discloses a low path switching part selectively connecting a low path of a backlight lamp with a ground voltage source in response to an external inverter

ON/OFF signal (Figure 1 shows a low path switching part as switches 8, 9 and 10 which selectively connect the backlight of the lamps 5, 6 and 7 respectively to ground in response to an inverter ON/OFF signal, which is explained in column 3, lines 4-6 and lines 24-35. Figure 2 shows that when the inverter is ON, which is in response to the state of switch 2 to control the inverter from being ON/OFF, i.e. an inverter ON/OFF signal, then the switches 8, 9 and 10 are controller to be ON/OFF.).

Regarding claim 11, Payne and Okita disclose the device according to claim 10. Payne also discloses wherein the low path switching part includes:

a first driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 can supply a voltage to the low path of the backlight lamp in response to the ON/OFF signal, ENABLE. Q5 receives the ON/OFF signal through U1 connection 1, then the driver, Q5 and Q6, supplies the inverter drive voltage, VCC, which is also received through U1 connection 1, to the first switching part which is connected to the low path of the backlight lamp); and

a first switching part (Figures 2A, 2B, 2C and 2D, items QX1 and Q2) connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver (Figures 2A, 2B, 2C and 2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1,

which is connected to ground. Q2 receives an output signal from Q6 and Q5, the driver, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground).

Regarding claim 12, Payne and Okita disclose the device according to claim 11.

Payne also discloses the first driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) includes:

a first switch being switched in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

a second switch supplying the inverter drive voltage to the first switching part in response to a state of the first switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply the inverter drive voltage, VCC, which it receives through U1 connection 1, to the first switching part, Q2 and Qx1).

Regarding claim 13, Payne and Okita disclose the device according to claim 12.

Payne also discloses wherein the first switching part (Figures 2A, 2B, 2C and 2D, items Q2 and QX1) includes:

first and second field effect transistors (Q2 and Qx1 are shown in Figure 2A to be FETs) connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch (Figures 2A, 2B, 2C and

2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1, which is connected to ground. Q2 receives an output signal from Q6, the second switch, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground); and

a resistor (Figure 2D, item R3) connected between the low path of the backlight lamp and the first field effect transistor (Figures 2A, 2B, 2C and 2D, item R3 is connected to 108, the low path of the backlight lamp, and also connected to the first field effect transistor, Q2, through the connection between Q2 and Q14 and then through line 106).

Regarding claim 14, Payne and Okita disclose the device according to claim 10.

Payne also discloses wherein the shutdown circuit includes:

a second driver (Figures 2A, 2B, 2C and 2D, items Q6 and Q5) selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the-shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 supply the inverter drive voltage VCC through U1 connection 1 to the low path of the backlight lamp through Q2 in response to ENABLE which is received through U1 connection 1);

a second switching part (Figures 2A, 2B, 2C and 2D, items Q13 and Q14) providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are a part

of item 15 of Figure 1. Column 3, lines 33-37 states that a detection circuit sends a signal to disable the inverter circuit if a malfunction is detected. The examiner interprets this as providing either an enabling or disabling function, and as seen in Figures 2A, 2B, 2C and 2D, Q13 can receive a signal from Q6 of the second driver through its connection to Q2); and

an error amplifier monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part (Figure 1, items 15 and 106 and column 5, lines 24-25. The examiner interprets this to mean that monitoring is occurring at all times which would also be when the shutdown function is enabled by the second switching part).

Regarding claim 15, Payne and Okita disclose the device according to claim 14.

Payne also discloses wherein the second driver (Figures 2A, 2B, 2C and 2D, items Q5 and Q6) includes:

a third switch being switched in response to the shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

a fourth switch supplying the inverter drive voltage to the second switching part in response to a state of the third switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply the inverter drive voltage, VCC, which it receives through U1 connection 1, to the second switching part, Q13 and Q14).

Regarding claim 16, Payne and Okita disclose the device according to claim 15.

Payne also discloses wherein the second switching part (Figures 2A, 2B, 2C and 2D, items Q13 and Q14) includes:

third and fourth field effect transistors (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are FETs) connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are connected to the low path of the backlight lamp through Q14 which is connected to item 108, the low path of the lamp. Q14 is connected to ground through C9. Q13 receives an output signal from Q6, the second switch, through Q2 which would therefore allow Q13 and Q14 to connect 108, the low path of the backlight lamp, to ground); and

a resistor (Figure 2D, item R3) connected between the low path of the backlight tamp and the third field effect transistor (Figures 2A, 2B, 2C and 2D, item R3 is connected to 108, the low path of the backlight lamp, and also connected to the first field effect transistor, Q14 through line 106).

Regarding claim 18, Payne discloses a method for monitoring a backlight lamp of a liquid crystal display, comprising:

receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of a backlight lamp (Column 5, lines 7-14); and

receiving a voltage input (Figure 1, item 106) through the low path of the backlight lamp (Figure 1, item 108) to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal (Column 3, lines 33-37.The examiner interprets the signal sent to disable the inverter circuit to be the shutdown ON/OFF signal).

Payne fails to teach of the method comprising a plurality of backlight lamps and selectively connecting a low path of each of the backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal.

Okita disclose of the method comprising a plurality of backlight lamps and selectively connecting a low path of each of the backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal (Figure 1 shows a low path switching part as switches 8, 9 and 10 which selectively connect the backlight of the lamps 5, 6 and 7 respectively to ground in response to an inverter ON/OFF signal, which is explained in column 3, lines 4-6 and lines 24-35. Figure 2 shows that when the inverter is ON, which is in response to the state of switch 2 to control the inverter from being ON/OFF, i.e. an inverter ON/OFF signal, then the switches 8, 9 and 10 are controller to be ON/OFF.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to provide the method of selectively connecting the lamps to ground as taught by Okita in the method taught by Payne to ensure that it is possible to control a plurality of lamps with only one inverter in order to realize an inexpensive, compact system where useless power consumption can be prevented.

Regarding claim 19, Payne and Okita disclose the method according to claim 18.

Payne also discloses wherein the step of selectively connecting a low path includes:

selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 can supply a voltage to the low path of the backlight lamp in response to the ON/OFF signal, ENABLE. Q5 receives the ON/OFF signal through U1 connection 1, then the driver, Q5 and Q6, supplies the inverter drive voltage, VCC, which is also received through U1 connection 1, to the first switching part which is connected to the low path of the backlight lamp); and

connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver (Figures 2A, 2B, 2C and 2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1, which is connected to ground. Q2 receives an output signal from Q6 and Q5, the driver, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground).

Regarding claim 20, Payne and Okita disclose the method according to claim 19.

Payne also discloses wherein the step of selectively supplying the inverter drive voltage includes:

switching a first switch in response to the inverter ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

supplying the inverter drive voltage to the first switching part in response to a state of the first switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply the inverter drive voltage, VCC, which it receives through U1 connection 1, to the first switching part, Q2 and Qx1).

Regarding claim 21, Payne and Okita disclose the method according to claim 20.

Payne also discloses wherein the step of connecting the low path includes connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch (Figures 2A, 2B, 2C and 2D, items QX1 and Q2 are connected to the low path of the backlight lamp through the connection between Q2 and Q14, Q14 being connected to item 108, the low path of the lamp. Q2 is then connected to QX1, which is connected to ground. Q2 receives an output signal from

Q6, the second switch, which would therefore allow Q2 and QX1 to connect 108, the low path of the backlight lamp, to ground);

Regarding claim 22, Payne and Okita disclose the method according to claim 21.

Payne also discloses wherein the step of receiving a voltage input includes:

selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the-shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, items Q5 and Q6 supply the inverter drive voltage VCC through U1 connection 1 to the low path of the backlight lamp through Q2 in response to ENABLE which is received through U1 connection 1);

providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are a part of item 15 of Figure 1. Column 3, lines 33-37 states that a detection circuit sends a signal to disable the inverter circuit if a malfunction is detected. The examiner interprets this as providing either an enabling or disabling function, and as seen in Figures 2A, 2B, 2C and 2D, Q13 can receive a signal from Q6 of the second driver through its connection to Q2); and

monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part (Figure 1, items 15 and 106 and column 5, lines 24-25. The examiner interprets this to mean that

monitoring is occurring at all times which would also be when the shutdown function is enabled by the second switching part).

Regarding claim 23, Payne and Okita disclose the method according to claim 22.

Payne also discloses wherein the step of selectively supplying the inverter drive voltage includes:

switching a third switch in response to the shutdown ON/OFF signal (Figures 2A, 2B, 2C and 2D, item Q5 is switched in response to ENABLE, the inverter ON/OFF signal, through U1 connection 1); and

supplying the inverter drive voltage to the second switching part in response to a state of the third switch (Figures 2A, 2B, 2C and 2D, item Q6 can supply the inverter drive voltage, VCC, which it receives through U1 connection 1, to the second switching part, Q13 and Q14).

Regarding claim 24, Payne and Okita disclose the method according to claim 23.

Payne also discloses wherein the step of providing one of an enabling and disabling shutdown function includes connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch (Figures 2A, 2B, 2C and 2D, items Q13 and Q14 are connected to the low path of the backlight

lamp through Q14 which is connected to item 108, the low path of the lamp. Q14 is connected to ground through C9. Q13 receives an output signal from Q6, the second switch, through Q2 which would therefore allow Q13 and Q14 to connect 108, the low path of the backlight lamp, to ground)

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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SS

4 January 2007

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SUPERVISORY PATENT EXAMINER